



(U) HURRICANE MATTHEW: ENERGY SECTOR – ELECTRICITY SUBSECTOR INFRASTRUCTURE IMPACT ASSESSMENT

(U) October 6, 2016, 1630 EDT

(U) PREPARED BY: OFFICE OF CYBER AND INFRASTRUCTURE ANALYSIS

(U) SCOPE

(U) The U.S. Department of Homeland Security (DHS)/Office of Cyber and Infrastructure Analysis (OCIA) produces Infrastructure Impact Assessments to provide an overview of risks to critical infrastructure from all hazards. The information in this assessment is intended to inform DHS leadership and partners on the current conditions and most critical concerns related to Hurricane Matthew, which is forecast to approach Florida by Friday, October 7, 2016. This product describes the potential effects in Florida and Georgia to the Energy Sector – Electricity Subsector from Hurricane Matthew. The information contained in this assessment is based on National Oceanic and Atmospheric Administration forecasts, open source reporting, and OCIA modeling. This product has been developed using the 0800 EDT, October 6, 2016, National Hurricane Center forecast.

(U//FOUO) This product was shared with the Department of Energy/Office of Electricity Delivery and Energy Reliability.

(U) KEY FINDINGS

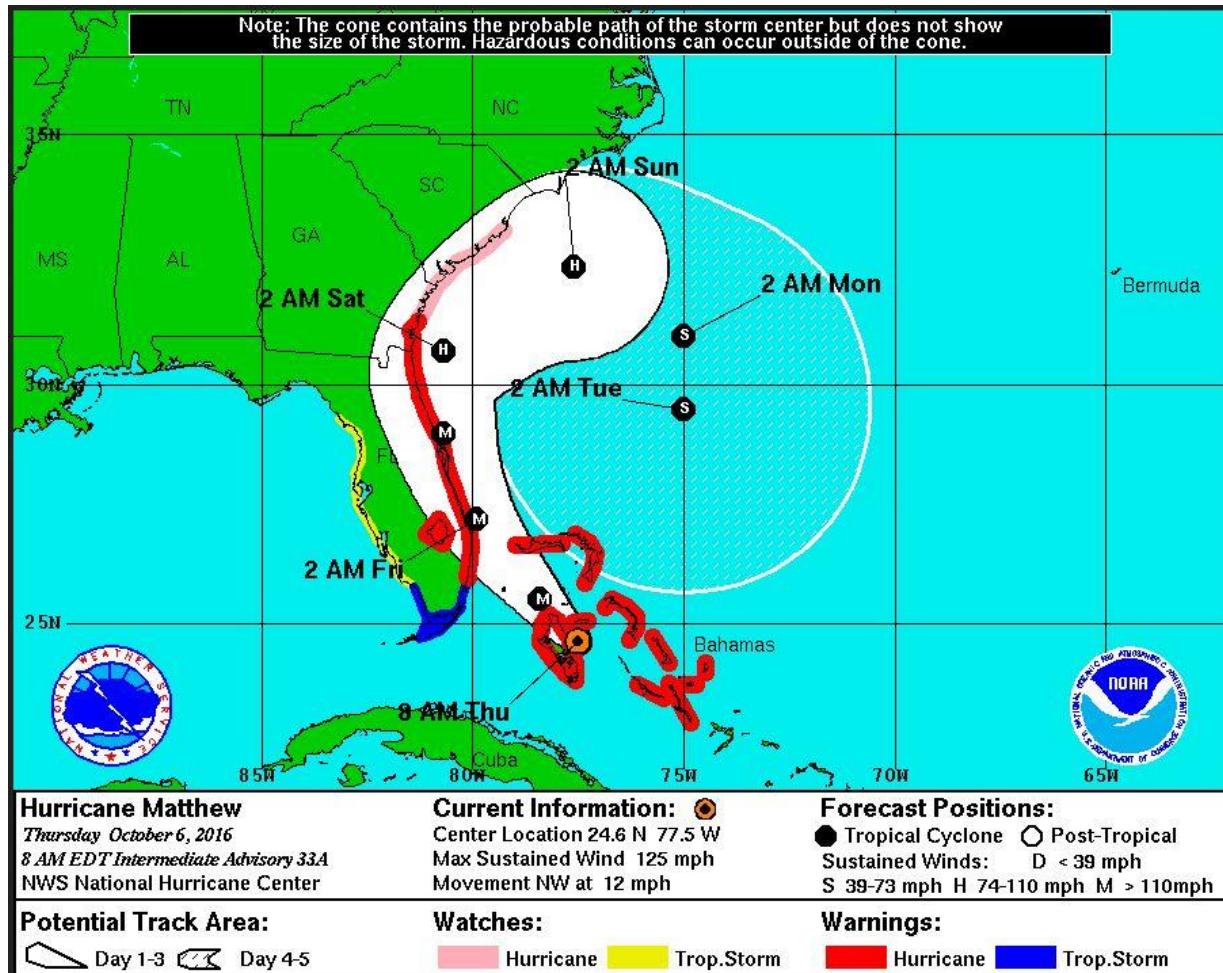
- (U//FOUO) OCIA assesses that there will be a moderate regional impact to the Electricity Subsector from Hurricane Matthew because of the number of Electricity Subsector assets forecast to experience Category 4 wind speeds in excess of 130 miles per hour. The 51 to 100 percent electric power outage zone contains 34 electric generating stations, 279 substations, and 1 nuclear power plant.
- (U//FOUO) OCIA assesses that electric power customers are at a moderate risk for service disruptions from Hurricane Matthew. This analysis does not consider specific enhancements electric utilities may have taken to harden assets. These enhancements may be deployed to mitigate impacts to generation, transmission, and distribution assets from wind, debris, water, or other hazards.

(U) BACKGROUND

(U) As of 0800 EDT, Thursday, October 6, 2016, Hurricane Matthew was located at 24.6°N. and 77.5°W., approximately 215 miles southeast of West Palm Beach, moving north by northwest at around 12 mph.¹ The maximum sustained winds Hurricane Matthew are of 125 mph, and a minimum central pressure of 940 millibars. Hurricane Matthew is a Category 3 storm on the Saffir-Simpson Hurricane Wind Scale. Tropical storm force winds extend out to 160 miles.

¹ (U) National Oceanic and Atmospheric Administration – National Hurricane Center. Hurricane Matthew – Advisory Number 33A. 0800 EDT. October 6, 2016. <http://www.nhc.noaa.gov/text/refresh/MIATCPAT4.shtml/061143.shtml>. Accessed October 6, 2016.

(U) On the forecast track, Hurricane Matthew is expected to continue its current general motion on Thursday, October 6, 2016, followed by a turn to the north-northwest in the evening. Hurricane Matthew will move across the Bahamas through Thursday, October 6, 2016, and is expected to be near the east coast of Florida by Thursday evening. Additional strengthening is expected today, Thursday, October 6, 2016, with Matthew expected to be a Category 4 storm as it approaches the east coast of Florida.



(U) FIGURE I—HURRICANE MATTHEW PROJECTED TRACK AS OF 0800 EDT, OCTOBER 6, 2016²

(U) SECTOR IMPACT ASSESSMENT

(U//FOUO) OCIA assesses there will be moderate regional impacts to the Electricity Subsector from Hurricane Matthew because of the number of Electricity Subsector assets forecast to experience Category 4 wind speeds in excess of 130 miles per hour (figure 2). The moderate assessment impact is guided by the following attributes:

- (U//FOUO) OCIA modeling indicates that there are 34 non-nuclear electric power generation facilities are located in the 51 to 100 percent electric power outage zone. The total non-nuclear generating output at risk for disruption is approximately 23,085 megawatts (MW) out of 59,444 MW of total generating capacity in Florida (approximately 38 percent).^{3,4}

² (U) National Oceanic and Atmospheric Administration – National Hurricane Center. Hurricane Matthew – Advisory Number 33A. 0800 EDT. October 6, 2016. http://www.nhc.noaa.gov/refresh/graphics_at4+shtml/094542.shtml?5-dayn#contents. Accessed October 6, 2016.

³ (U//FOUO) Department of Homeland Security – National Infrastructure Simulation and Analysis Center Analysis. FASTMap Report Electric Power Infrastructure using 0800 EDT October 6, 2016 Hurricane Swaths – Non Nuclear Generation. Accessed October 6, 2016.

⁴ (U) U.S. Energy Information Administration. Florida State Energy Profile - Electric Power Industry Net Summer Capacity. <http://www.eia.gov/state/print.cfm?sid=FL>. Accessed October 6, 2016.

- (U//FOUO) OCIA identified the Saint Lucie nuclear power plant in Ankona, Florida. (Only one nuclear power plant is within the 51 to 100 percent electric power outage zone.) The Saint Lucie Nuclear Power Plant has a generating output at risk for disruption of 950 MW, as Unit 1 is shut down for a refueling outage.^{5,6} Staff at the Saint Lucie Nuclear Power Plant declared an unusual event on Tuesday, October 4, 2016 and the Nuclear Regulatory Commission is on-site to oversee storm preparations.⁷
- (U//FOUO) Brunswick Nuclear Power Plant in Southport, North Carolina, is located in the 26 to 50 percent electric power outage zone and not expected to be disrupted.
- (U//FOUO) OCIA identified approximately 279 substations in the 51 to 100 percent electric power outage zone at risk for disruption. This analysis does not consider location specific hardening and resilience enhancements that electric utilities may have made to transmission and distribution assets, including substations, which may be able to further mitigate the magnitude of impacts from Hurricane Matthew wind speed forecasts.⁸

(U//FOUO) OCIA assesses that electric power customers are at a moderate risk for service disruptions from Hurricane Matthew. The moderate assessment impact is guided by the following attributes:

- (U//FOUO) Electric utilities have detailed plans for restoration of electric service to customers after storm conditions subside. Utilities begin the process of restoration by ensuring electricity is not flowing through downed power lines. Utilities will then proceed with restoration of service based on established priorities of customers.⁹
- (U//FOUO) Electric utilities affected by Hurricane Matthew may also engage the support of Regional Mutual Assistance Groups, which may offer crews, equipment, and assets to rebuild power lines, replace power poles, and restore power to customers.¹⁰
- (U//FOUO) This analysis does not consider specific storm hardening and resilience measures electric utilities may have deployed to mitigate impacts to generation, transmission, and distribution assets. Electric infrastructure storm hardening and resilience measures exceed current design and engineering practices.¹¹

⁵ (U//FOUO) Department of Homeland Security – National Infrastructure Simulation and Analysis Center Analysis. FASTMap Report Electric Power Infrastructure using 0800 EDT October 6, 2016 Hurricane Swaths –Nuclear Generation. Accessed October 6, 2016.

⁶ (U) Nuclear Regulatory Commission. NRC Preparing for Hurricane Matthew. October 6, 2016. <http://www.nrc.gov/reading-rm/doc-collections/news/2016/16-035.ii.pdf>. Accessed October 6, 2016.

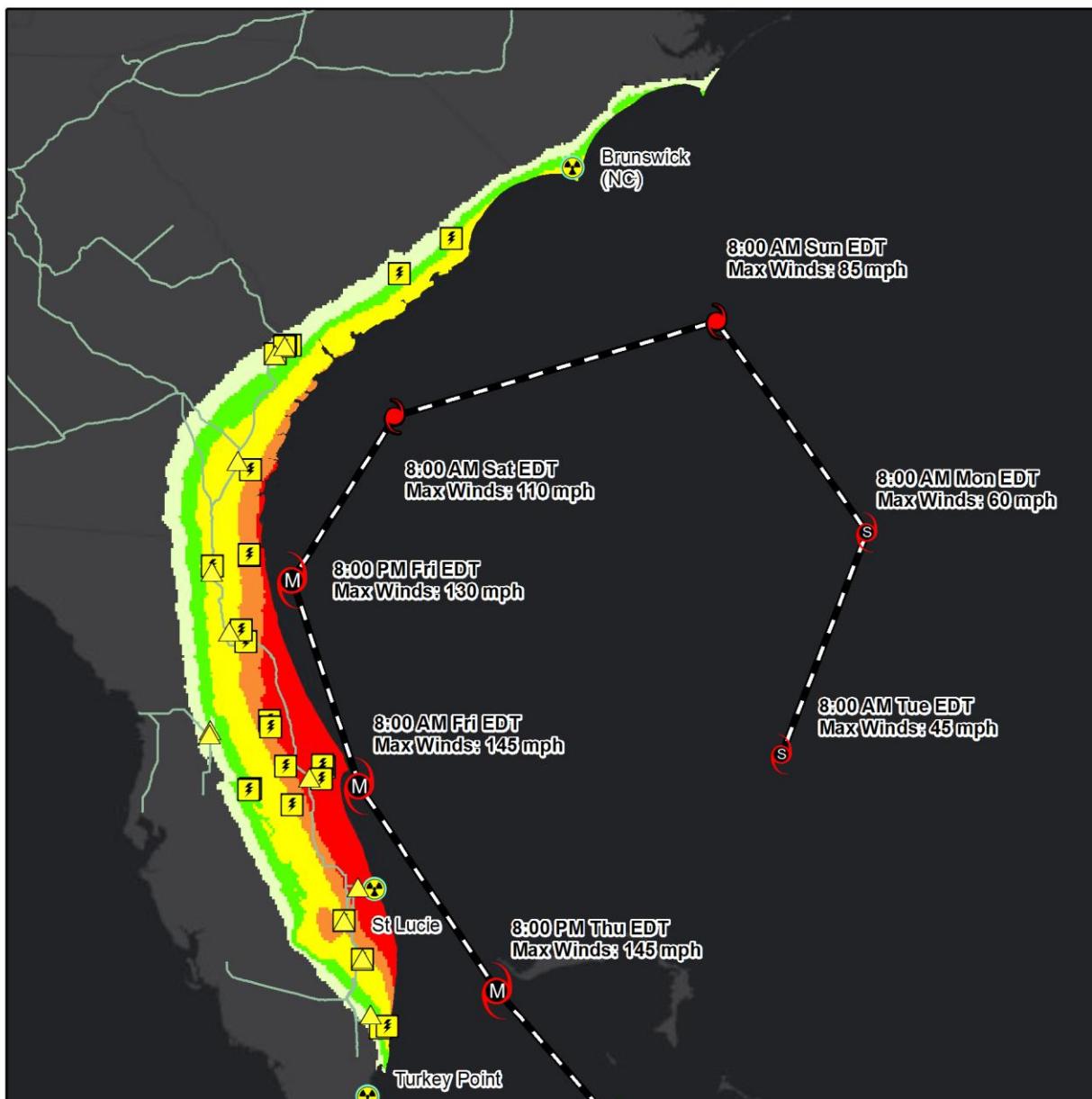
⁷ (U) Nuclear Regulatory Commission. NRC Preparing for Hurricane Matthew. October 6, 2016. <http://www.nrc.gov/reading-rm/doc-collections/news/2016/16-035.ii.pdf>. Accessed October 6, 2016.

⁸ (U//FOUO) Department of Homeland Security – National Infrastructure Simulation and Analysis Center Analysis. FASTMap Report Electric Power Infrastructure using 0800 EDT October 6, 2016 Hurricane Swaths –Electric Substations. Accessed October 6, 2016.

⁹ (U) Edison Electric Institute. Understanding the Electric Power Industry's Response and Restoration Process - The Storm Restoration Process. October 2016. <http://www.eei.org/IssuesAndPolicy/ElectricReliability/MutualAssistance/Documents/stormrestorationprocess.pdf>. Accessed October 6, 2016.

¹⁰ (U) Edison Electric Institute. Understanding the Electric Power Industry's Response and Restoration Process – How mutual assistance works. October 2016. http://www.eei.org/IssuesAndPolicy/ElectricReliability/MutualAssistance/documents/ma_101final.pdf. Accessed October 6, 2016.

¹¹ (U) Florida Public Service Commission. Electric Infrastructure Storm Hardening Activities. 2015 Utility Filings. <http://www.psc.state.fl.us/ElectricNaturalGas/EnergyInfrastructure>. Accessed October 6, 2016.



Hurricane MATTHEW Southeast, US

Substations
 Generation Facilities
 Nuclear Power Plants

Transmission Lines (Voltage)

- 230-287, In Service
- 345, In Service
- 500, In Service
- 735 and Above, In Service
- DC Line, In Service

Storm Information (Adv 34)

- Hurricane
- Major Hurricane
- Tropical Storm

Potential Track Area

Estimated Likelihood of Electric Power Outages

Likelihood Range	Color
1-10%	Light Green
11-25%	Medium Green
26-50%	Yellow
51-75%	Orange
76-100%	Red



GAB#: 16-2048
Data Sources: ESRI, NOAA, HSIP

0 Miles 240

(U//FOUO) FIGURE 2—HURRICANE MATTHEW ELECTRIC INFRASTRUCTURE AS OF 0800 EDT, OCTOBER 6, 2016,

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Very Satisfied (5)	Somewhat Satisfied (4)	Neither Satisfied Nor Dissatisfied (3)	Somewhat Dissatisfied (2)	Very Dissatisfied (1)
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Timeliness of product

Relevance of product

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Yes No If so, which efforts?

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